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THE UNIVERSITY OF ALBERTA

PREDICTION OF UNIVERSITY SUCCESS IN YEARS  
AFTER THE FIRST

BY



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A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES  
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UNIVERSITY OF ALBERTA  
FACULTY OF GRADUATE STUDIES

The undersigned certify that they have read, and recommend to the Faculty of Graduate studies for acceptance, a thesis entitled "Prediction of University Success in Years After the First" submitted by Edgar E. G. MacDonald in partial fulfillment of the Requirements for the degree of Master of Education.





## ABSTRACT

The present study was undertaken to investigate the prediction of academic success, in years after the first, at six universities located in the Atlantic Provinces.

Four comparisons were made; they were:

(1) A comparison of the predictive validity of the Grade XII Departmental Average and selected Standardized Test scores.

(2) A comparison of the Grade XII Departmental Average with University Averages as predictors of success in years of study after the first.

(3) A comparison of the predictability of success in various faculties.

(4) A comparison of combinations of predictor variables with single predictor variables.

The sample used was collected from a study begun by the Central Advisory Committee on Education (CAC) in 1958. It included all students who had taken part in the 1958 study and who had entered, in 1958 or 1959, one of the following universities: Acadia, Memorial, Mount Allison, Prince of Wales, Saint Dunstan's or Saint Francis Xavier.

Each university was considered separately due to differences in marking standards, courses offered etcetera. For similar reasons, faculties within each university were studied individually when sufficient numbers of students



were available.

Pearson correlations were calculated between the criteria, which included the Sophomore, Junior and Senior averages, and the twelve predictor variables. The predictors used were: the Grade XII Departmental Average, the three scores of the School and College Ability Test (SCAT), the seven subtest scores of the Cooperative English Test and the College Entrance Examination Board's Intermediate Mathematics Test. Intercorrelations between the various university averages were also calculated. Multiple correlations were then calculated to determine whether a combination of predictors would significantly improve prediction over that obtained from single variables.

The results of the study indicated that:

(1) Within the university the best predictor of success in any year of study, after the first, was the average of the preceding year.

(2) The best single predictor among the external variables was the Grade XII Departmental Average.

(3) Success in the Science Faculty was most predictable followed in order by Engineering, Arts and Education.

(4) In most cases the multiple correlation technique did not significantly improve prediction.



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## CHAPTER I

### INTRODUCTION

#### Background to the Problem

For many years entrance to universities in the Atlantic Provinces has been subject to the results of external examinations conducted at the end of secondary school. These examinations are conducted in New Brunswick by the Examining Board of that province and in Nova Scotia, Prince Edward Island and Newfoundland by the Atlantic Provinces' Examining Board. In all cases the general procedure is the same. The examinations are set by external examiners and corrected by teams of teachers at an examining centre. The examiners are usually Departmental officials, school inspectors or university professors, and they are chosen for their knowledge of the subject being examined.

The results of these examinations have for many years been used by the Atlantic universities to determine admission to their faculties. The underlying assumption has been that the marks received as a result of these post-secondary examinations, taken together, give the best prediction of success at university as indicated by the university averages. The truth of this hypothesis, as it relates to the second and succeeding years at university is examined in this study.

In 1958 the Central Advisory Committee on Education (C.A.C.), in the Atlantic Provinces conducted a series of



tests in the high schools of the Atlantic Provinces. A brief description of the tests is given in chapter three. The purposes of administering these tests, as given in C.A.C. Report No. 2 (Mowat & Ross, 1962) were as follows:

1. To compare the achievement of high school students in the Atlantic Provinces with the achievements of high school students in the United States in English and Mathematics.
2. To find out how many students do not go to university but have ability similar to those who do.
3. To find out if there is a better way of identifying those who will profit by university education than the present external examination (p. 2).

The results of this study as indicated in Report No. 2 were:

1. High School Average is much the best predictor of university success as measured by the average of first year university marks.
2. After High School Average, marks in individual high school subjects were found to be the next best predictors. After those come the various standardized tests.
3. High School Average is not only the best predictor of general university success, but also the best predictor of success in individual subjects of university study. After High School Average the best predictors are those whose subject matter is the same as the subject matter of the university course (p. 14).

During the years from 1958 to 1964, information was collected from the various universities regarding the performance of students in years after the first. This material was used by Mr. Andrew S. Pau in a study comparing the high school average with the marks obtained on the various standardized tests as predictors of university success in years later than the first.



Mr. Pau's study, which was reported in his Master of Arts thesis submitted in 1965, dealt with results for various groups at Dalhousie University and the University of New Brunswick. Pau's results are very briefly summarized below; a later chapter will present the results in more detail. Briefly, then, Mr. Pau found that in general results at Dalhousie and University of New Brunswick for the second and subsequent years were similar to those for the first as outlined by C.A.C. Report No. 2.

The High School Average was found to be a better predictor of university success than the standardized tests. Also he found that for any year of university after the first the best predictor of success was the university average of the preceding year.

#### Purpose of the Study

The present study was set up to investigate the problems of predicting success in years after the first at the following Atlantic Universities: Acadia, Memorial, Mount Allison, Prince of Wales, Saint Dunstan's and Saint Francis Xavier. The following four tasks were undertaken:

- (1) To compare the grade XII average and standardized test scores as predictors of success in Sophomore, Junior and Senior years.
- (2) To compare the high school average and university averages as predictors of success in years after



the first.

- (3) To find out if success can be predicted more readily in one faculty than another.
- (4) To ascertain the effect of combining various single predictor variables on the prediction of success in years after the first.

### Limitations of the Study

In a study, such as this, which involves a variety of institutions the researcher must be sensitive to the comprehensive nature of the data gathered. Since the universities varied in the nature of programs offered and in marking standards, it was necessary to consider each university separately. Furthermore, since faculties vary along similar lines it was also necessary where possible to treat faculties separately. Such divisions of data resulted in the following limitations:

(1) Each sample or group was quite small resulting in large errors of measurement and less reliable results than desirable.

(2) Groups were deleted from the study or were combined with other 'similar' groups thus making interpretation difficult. For example, if fewer than twenty subjects were available in a second year Commerce group they were dropped from the study or combined with an Arts group in the same year of studies at the same university.





(3) Since the number of subjects in many groups was quite small it was impossible to investigate the relationship between the sex of student and the predictability of college grades.

A further limitation, not related to sample size, was the nature of the predictor variables used. In every case the predictors were of an academic nature. Undoubtedly, non-academic factors, such as personality, play an important role in university success. Although an investigation of these factors would probably lead to improved prediction of success they were not considered in this study.



## CHAPTER II

### SURVEY OF THE LITERATURE

Many studies pertaining to the prediction of success in higher education have been completed at various types of universities, liberal arts colleges and technical schools both in the United States and Canada. In nearly all of the studies reviewed, the criterion of success was the first year average or portion thereof. In a few cases the criterion was the average obtained in years after the first or grades received in specific subject areas.

The predictor variables used in the numerous studies varied greatly and included non-academic as well as academic variables. In order to facilitate presentation, discussion and generalization to the present study the writer classified the predictors into areas. Non-academic predictors were omitted from the survey since they do not fall within the scope of the present research.

High School Record which was the first classification included high school average and high school rank. The second included Achievement and College Entrance Tests. The third included general and specific Aptitude Tests and the fourth Intelligence Tests and Psychological Examinations.



## United States Studies

### High School Record and Success at University

Almost all American studies reviewed found that the High School Record was the best single predictor of college success. The correlation coefficients ranged from .32 to .70 with a mean of approximately .55. Douglas (1931) in a review of sixty-seven studies completed prior to 1931 reported a mean correlation of .54. Garrett (1949) in another review reported thirty-two correlation coefficients ranging from .29 to .83 with a median value of .56. Abelson (1952), Cosand (1953), McCormack & Asher (1964) and Munday (1967) in other summaries reported correlations of similar magnitude.

In studies, which controlled for sex of the student, Ficken (1935), Abelson (1952), Klugh & Bierley (1959), Hornaday (1962), Michael & Zimmerman (1967) and Richards & Holland (1967), it was found that the predictability of college grades for girls was consistently better than that for boys. This trend was also evident for all other predictors.

As noted previously, very few studies investigated the predictability of success after the first year of college. Ficken (1935) in a study completed at Macalester College tested the value of High School Rank as a predictor of success in five semesters of college work. For one sample he found a



correlation of .69 between the predictor and the average for five semesters of college work for both males and females. For the second sample he found correlations of .56 and .61 for males and females respectively. In another study Richards and Holland (1967), using High School Average as their predictor, reported an increase in the correlation coefficients from first to second year. The predictor correlated .32 and .37 with First Year Average for men and women respectively. For the second year the respective correlations were .44 and .48.

These findings by Richards and Holland were not supported by Garrett's extensive survey of 1949. Garrett concluded from his review that High School Average predicted First Year Average better than the college average of any lesser or greater part of the total college course.

### Achievement and College Entrance Tests

The correlation coefficients for this group of tests ranged from .23 to .64 with a mean of .45. A slightly higher median correlation of .49 was reported by Garrett (1949) and Durflinger (1943) in their surveys.

The two most prominent tests within this grouping were the Cooperative Tests (COOP) and the American College Test (ACT). Of these two the greatest volume of research has been centered on the COOP test mainly because it was published before the ACT. Much current research however, is being done





on the ACT battery.

Hertel and DiVesta (1948) and Chahbazi (1956) found that the COOP Tests correlated quite poorly with Freshman Grades at New York State College of Agriculture at Cornell. Using COOP Mathematics as their predictor Hertel and DiVesta reported a correlation of .25 with the criterion, while Chahbazi reported correlations of .35, .32 and .27 respectively between COOP Mathematics, COOP Science and COOP Reading and Freshman Grades.

The highest correlations between the COOP Tests and college success were found when the English subtest was used. Webb and McCall (1953) in a study completed at Emory University reported a correlation of .55 between COOP English total score and Freshman Average. Vick and Hornaday (1962) using Freshman Grades at Greensboro College as their criterion of success found correlations of .57 for COOP English Total score and .53 for the Expression subtest of the COOP English.

The ACT testing program which began in 1959 has to date stimulated quite extensive research. The ACT test battery including English, Mathematics, Social Studies and Natural Science subtests was designed to measure educational development in the areas indicated by the subtest headings. The battery yields four individual subtest scores as well as a composite score when the subtests are combined. Two extensive research programs were undertaken to test the



validity of the ACT for the prediction of college success.

Munday (1967) tested the predictive validity of the ACT with a sample chosen from 398 colleges and universities which took part in the ACT research program in 1963, 1964 and 1965. Using a weighted ACT battery, he calculated correlations between the battery and grades in college English, Mathematics, Social Studies, Natural Sciences and total college course to be .51, .42, .50, .49 and .52 respectively.

Richards and Holland (1967) in another extensive study used the Social Studies subtest of the ACT to predict Freshman and Sophomore Averages at several institutions. For the Freshman sample they found correlations of .29 and .44 for male and female students respectively. For the Sophomore sample the correlations were .39 and .43 respectively. Other researchers including Boyce and Paxson (1965), DeSena and Weber (1965) and Lins (1966) reported correlations of .50 or better between ACT scores and College Grades.

A third special achievement test which yielded relatively high correlation coefficients with college grades was the Michigan State College Reading Test. R.A. Jackson (1955) reported a correlation of .64 between this predictor and Freshman Grades at Michigan State College. Henderson and Masten (1959) and Lanigan (1947) also used the Michigan State College Reading Test and reported correlations of .58 and .54 respectively with Freshman Average.



## Aptitude Tests

The greatest volume of research in the area of prediction has been centered on aptitude tests with special emphasis on the School and College Ability Test (SCAT) and the College Entrance Examining Board Scholastic Aptitude Test (SAT). Four of the studies reviewed compared the SCAT and SAT as predictors of success for the same sample of students.

Juola (1960), in a study designed to predict the First Quarter Average at Michigan State College, found that the two tests yielded comparable correlation coefficients with the criterion. The correlations for SCAT-Verbal, SCAT-Quantitative and SCAT-Total were .59, .57, and .68 respectively, while those for SAT-Verbal, SAT-Mathematical and SAT-Total were .55, .53, and .65 respectively.

Mann (1961) also reported correlations of similar magnitude for both tests although they were larger than those found by Juola. The relatively large correlations, which were all over .61, were attributed by Mann to the nature of his sample which included only female students.

McCormack and Asher (1964), in their study comparing the predictive power of SCAT and SAT, chose their sample of university students on the basis of attendance at the same high school previous to university entrance. Using First Semester Average as their criterion, they found the SAT to be somewhat better than the SCAT correlating .40 and .48





for the Verbal and Mathematical subtests respectively. In comparison SCAT-Verbal and SCAT-Quantitative correlated .31 and .37 respectively.

The fourth study, comparing the SCAT and SAT, was undertaken by Boyce and Paxson (1965) at Troy State College. In predicting the First Quarter Average they found that only the Verbal subtests differed in predictive power. The SCAT-Verbal correlated .49 with the criterion while SAT-Verbal correlated .36.

Other aptitude tests reported in the studies summarized were the Differential Aptitude Test, the General Aptitude Test Battery and the College Qualification Tests. The correlations between these tests and university average ranged from .04 (Sharp and Picketts, 1959) to .63 (Vineyard, 1958).

### Intelligence Tests and Psychological Examinations

The correlations for these tests ranged from .02 to .65 with a mean of .43. Correlations of about the same size were reported in other summaries by Douglas (1931), Segel (1934), Garrett (1949), Berdie (1951), Cosand (1953) and Abelson (1952).

Nearly all of the studies reviewed used the American Council on Education Psychological Examination (ACE) as the predictor of college success. In all studies which compared the predictive validity of the two subtests of the ACE the Linguistic score was found to correlate higher with college





success than the Quantitative score. In most cases however, the ACE score used for prediction purpose was the ACE-Total which resulted from combining the two subtests.

### Combination of Predictors

Many of the studies reviewed used various combinations of variables to improve prediction. The range of multiple correlations for the studies summarized was .23 to .83 with a median of .58. Garrett (1949) reported similar results. In his summary of fifty-nine studies he found that the best combination included High School Average and Intelligence Test scores which yielded a multiple correlation with college grades of .79.

Cosand (1953) in another review reported a multiple correlation of .83 between High School Average, Intelligence Test score and English Grade in high school combined and Freshman Average.

Webb and McCall (1953) found that Freshman Average could be predicted best at Emory University by combining SAT-Verbal, SAT-Mathematics, CEEB-English, High School Average, COOP-English and COOP-Total Reading; this combination gave a multiple correlation with the criterion of .79.

Mann (1961) combined High School Rank with SAT-Verbal and SAT-Mathematics and found that they correlated .82 with the Freshman Average. Using SCAT-Verbal and SCAT-Quantitative with High School Rank he found the multiple



correlation to be .83.

Other multiple correlations of .70 or better were reported by Klugh and Bierley (1959), Long (1964), Foster and Danskin (1965) and Lins, Abell and Hutchins (1966).

### Canadian Studies

Canadian studies in the area of prediction of university success have been given more detailed attention since they are more relevant to the present study. Although the number of studies completed in Canada is quite small they are in many cases longitudinal and substantive.

Several studies, related to prediction and college grades, have been completed at the University of Alberta in conjunction with the establishment in 1954 of a Matriculation Study Subcommittee. This committee was established by the Department of Education, in order to test the predictive validity of Departmental and various standardized tests.

Evenson & Smith (1958) compared the validity of the Grade XII Departmental Average and ACE in predicting First, Second, Third, and Fourth Year University Averages of students entering the University of Alberta in 1951. In every case the Grade XII Average was found to correlate higher with the university averages than the ACE. Using the Grade XII Average as a predictor the largest correlation found was .59 between the predictor and First Year Average



in the Engineering faculty. The lowest was .36 between the predictor and Third Year University Average for all faculties. Continuing the study Evenson & Smith (1958) investigated the relationship between First Year University success and the following predictors: Grade XII Departmental marks, CEEB tests, SAT, and SCAT. They found that Departmental marks correlated consistently higher with First Year success than the other predictors. The correlations ranged from .24 between Departmental English and First Year Average to .58 between Departmental Physics and First Year Average.

Black (1960) and Zurowsky (1959) combined various standardized tests and Departmental exams which were given in the 1956 survey by Evenson & Smith to compute multiple correlations with Freshman Grades. Black concluded that the best combination of predictor variables included English 30, Social Studies 30, Mathematics Average, Science Average and Foreign Language Average. Using the same data Zurowsky (1959) in a Master's thesis compared the predictive value of Grade IX and XII Departmentals, SCAT, COOP-English, Mechanics of Expression, and COOP English Reading Comprehension with selected university courses and university average. He found that the grade XII Science Average was the best single predictor for not only the First Year Average but also for all individual course areas used as criteria. He



found a correlation of .63 between First Year Average and Grade XII Science Average. The correlation was raised only by combining the several predictors; they gave a multiple correlation of .66.

Clarke (1958) reported two other studies conducted at the University of Alberta by Fitzpatrick and Fair. In a study of 253 engineers entering the faculty of engineering in 1954-55, Fitzpatrick reported a correlation of .67 between First Year Average and Grade XII Math-Science Average. The correlation between the First Year University and High School Average was .50 and that between First Year Average and ACE exam was only .23. Fair studied one hundred Arts and Science Freshmen entering the University of Alberta in 1953. He found the grade XII Departmental Average a better predictor of First Year Average ( $r = .64$ ) and Third Year Average ( $r = .41$ ) than the ACE. He also found that the First Year Average was the best predictor of success in the Third ( $r = .69$ ).

Mack (1963) compared the predictive value of ACE exams, the A and C.2 portions of the Cooperative English exam and the High School Average. He found that for the five faculties studied at University of Alberta (Arts, Science, Education, Engineering, others) the High School Average was the best single predictor of success in the First Year. These correlations ranged from a high of .72 between grade XII Average and First Year Science Average to







.45 between grade XII Average and First Year Education Average.

Knowles & Black (1965, 1966) studied several factors influencing the prediction of Freshman success at the University of Alberta. Their sample consisted of Freshmen entering the faculties of Arts, Education, Engineering and Science in 1962. Their studies showed that: (1) prediction of university success for students from larger high schools with more than twenty-five teachers was considerably better than for students from smaller schools as indicated by a much higher multiple correlation between the various predictors and first year success, (2) in prediction of First Year Averages it was found that the highest correlation was between the predictors and Engineering Average followed in order by Science, Arts and Education, (3) it was found that success in the First Year of University could be predicted better for females than males as indicated by the correlation between predictors and criterion, (4) grade XII Principal's Ratings of students' marks tend to be lower than Departmental examination scores and are not quite as valuable for prediction purposes.

In a series of reports completed for the Dean of Arts and Sciences at the University of Manitoba, P.A. Flynn, B.G. Nemes, A.J. Darling, P. Olin, T.S. Scott, B.W. Kirk, W.M. Kryniuk and R.U. Krutzen (1959, 1960, 1961, 1962, 1963) investigated the success of Manitoba High School students who entered the University of Manitoba via grade XI into first



year or via grade XII into second year. The reports dealt only with the first two years of University and covered the years 1958-1962. They found a mean correlation coefficient of .77 between Grade XI Average (accredited and non-accredited) with First Year Average. For SCAT Total and First Year Average a mean correlation coefficient of .52 was reported. The sample from second year university was divided into students who had entered directly from grade XII (Group B) and those who had entered via grade XI and first year University (Group A). The students were also divided according to which faculty they had entered (Arts, Science or Engineering).

For group A students who entered second year Arts the mean correlation between Grade XI Average and Second Year Average was reported as .65 while that for group B was reported as .64. For group A students who entered second year Science the mean correlation between Grade XI Average and Second Year University Average was found to be .65 and that for group B was .62. For group A who entered first year Engineering the mean correlation between Grade XI Average and First Year average was found to be .45 and that between Grade XI Average and First Year Average was .57.

In a study completed at York University in Ontario Endler & Steinberg (1964) compared the validity of High School Average (grade XII), the School & College Aptitude Test (SCAT) and the Sequential Tests of Educational Progress (STEP) in predicting Freshman Grades. Their sample consisted of



forty-five men and twenty-four women ranging in age from seventeen to twenty-eight. As shown by their results, the best predictor of First Year Average for both males and females was the High School Average. For males, the correlation between Freshman Average and High School Average was .49 and for females it was .84. Of the subtests of SCAT and STEP the best predictor for both males and females was STEP-Reading Achievement which yielded correlations with Freshman Average of .38 (males) and .64 (females). It was also noted that in all cases correlations between predictors and criterion were higher for females than males.

W.G. Fleming (1964) in conjunction with the Atkinson Study of Utilization of Student Resources, completed an extensive study on prediction of university grades. In this study samples from nearly every university in Ontario were used in comparing the effectiveness of Grade XI Average, Grade XII Average, Grade XIII Average, Scholastic Aptitude Test (SAT) and the School and College Aptitude Test (SCAT) in predicting success in the First, Second, Third and Fourth years of University.

Fleming found relatively low correlations ranging from a median of .25 to a median of .65. He found that for all four years of University the best predictor of success was the average of the preceding year. He reported median correlation of .66, .66, and .73 between First and Second, Second and Third, and Third and Fourth Years respectively.





Of the other predictor variables used the Grade XIII Average was the best predictor over all four years correlating .65, .50, .45 and .38 with First, Second, Third and Fourth Years respectively.

In Report No. 9 of the Atkinson Study Fleming (1962) focussed his attention on the prediction of first year success at the University of Toronto in Applied Science and Engineering, and General Arts, using the same predictor as for the other universities. For the Science and Engineering group he found the best predictor to be the Grade XIII Average on first attempts on three Math and three Science papers; this average correlated .60 with the criterion. For the Arts group he reported a correlation of .67 between the criterion and Grade XIII Average of first attempts on all subjects. Fleming found that combining the Grade XIII Average on first attempts on all papers, average on Grade XIII Math and Science papers, Grade XII Average and SAT-M he could raise the correlation to .66 for the Science and Engineering group. The correlation for the Arts group was elevated only .02 points to .69 by combining Grade XIII Average on all first attempts and Grade XII Average.

Fleming (1965) in Report No. 11 also reported the results of applying multiple correlation technique to prediction at University of Toronto, Queens University and University of Western Ontario. He found that combining the various predictors used in his study he raised the single





correlation an average of .05 for predicting Third and Fourth Year Averages. In all cases the best combination of variables included Grade XII Average, Grade XIII Average, SAT-V, SAT-M and Teachers' Ratings.

In the Atlantic provinces in 1958 an extensive prediction study was undertaken by Mowat and Ross (1962) in conjunction with the Central Advisory Committee on Education (CAC). In this study, which included nearly all universities in the Atlantic provinces, the High School Average was found to be the best predictor of college success as measured by First Year Average. The correlations between High School Average and the criterion ranged from .42 to .85, with a median of .65.

Extending the CAC study, Pau (1965) in a Master's thesis completed at Dalhousie University investigated the prediction of university success in years after the first at Dalhousie University and the University of New Brunswick. From his findings he concluded that High School Average, in general, correlates higher with university success than all other predictors used. For Dalhousie University he reported a median correlation of .65 between High School Average and University Averages in years after the first. For the University of New Brunswick the correlation approached .46. Pau also found that intercorrelations between various university years were high, with values of .72 for Dalhousie and .61 for the University of New Brunswick. He consequently



concluded that within the University the best predictor of success in any year after the first is the average of the previous year.

The important findings of this review which have relevance for the present study were as follows:

(1) The High School Record was the best single predictor of university grades.

(2) Within university, the best single predictor of success in any given year was the average obtained in the preceding year.

(3) Aptitude, Intelligence and Achievement tests were found to be equally good as predictors of university grades.

(4) University grades of female students were found to be more predictive than those for male students.

(5) Larger correlations were found between predictor variables and criterion variables at small institutions.

(6) Many researchers indicated a need to consider non-academic predictor variables such as motivation.

(7) An expressed need to develop predictive test batteries which could be given prior to high school entrance.

(8) Evidence to suggest the need for further research on prediction of success within specific subject areas.



## CHAPTER III

### COLLECTION OF DATA AND RESEARCH PROCEDURES

#### Samples

In this study, as in previous studies made with the CAC data, it was necessary to treat each university separately. This was done because academic programs vary substantially from one institution to another and because marking systems and standards also vary. For example, the pass mark at Saint Francis Xavier University, at the time of this investigation, was 60 per cent, while it was 50 per cent at the other universities where numerical marking is the rule.

It is necessary, if any meaning is to be extracted from the correlation coefficients, to deal with groups each composed of members following the same or similar curricula. This can be done at any university fairly well for the first year students where the variation in courses is not great. All classes taken are Freshman classes and all include classes in English and usually classes in Mathematics, History, Foreign Language and Science. However, in years after the first a much greater choice is offered to students especially in the larger universities. Thus one student in Arts may specialize in Chemistry and another in French and there is no guarantee that classes in the two subjects are



comparable in standard. To lessen the undetermined and undeterminable variations between classes in different subjects, students have been dealt with in groups which may be regarded as having a certain homogeneity. In some cases, at the smaller universities, categories joining two groups (such as Arts and Commerce) have been employed, partly because the classes taken were in fact not widely different and partly because groups such as Arts by themselves were not large enough to analyze. The following groups made up the final sample:

Students entering university in 1958:

1. Acadia University - Arts (Senior Matriculation)
2. Memorial University - Arts, Commerce and Science (Junior Matriculation)
3. Memorial University - Engineering (Junior Matriculation)
4. Memorial University - Education (Junior Matriculation)
5. Mount Allison University - Arts and Commerce (Senior Matriculation)
6. Mount Allison University - Engineering (Junior and Senior Matriculation)
7. Saint Dunstan's University - Arts, Commerce and Science (Junior Matriculation)
8. Saint Francis Xavier University - Arts and Commerce (Senior Matriculation)

Students entering university in 1959:

9. Mount Allison University - Arts and Commerce (Senior Matriculation)
10. Mount Allison University - Science (Senior Matriculation)
11. Prince of Wales College - Arts and Science (Junior Matriculation)
12. Saint Francis Xavier University - Arts and Commerce (Senior Matriculation)





Due to the small number of cases in each sample the standard error of the correlation coefficients tends to be quite large, therefore the results are not too reliable. It must be remembered too, that the groups or samples used were highly selected. For example, students in the first year of university have a much wider spread of averages than do those in the last two or three years of university. This probably resulted from poorer students leaving the university after failing in their first year. This would tend to lower the correlation coefficients between variables for university students in years after the first.

#### Description of Standardized Tests

In order to understand the predictors a brief description of the battery of standardized tests used by the C.A.C. is given in the following paragraphs. One well known test used was the School and College Ability Test (SCAT). This test measures directly 'school learned abilities', rather than psychological characteristics, which only indirectly measure capacity for school work. It is then, the purpose of these tests to estimate the capacity of each student to undertake the next higher level of formal schooling, rather than to discern his native capacity. The SCAT test used in the C.A.C. project consisted of four



subtests. Two of these measured quantitative skills in the solution of mathematical problems and manipulation of numbers, while the other two subtests measured skills in verbal types of school learning.

The second test given was the multilateral, Cooperative English Test, which can be divided into two subtests:

(a) Expression Tests and (b) Reading Tests. The Expression Test itself is a synthesis of two subtests: (i) Mechanics of Expression which is concerned with the proper use of linguistic tools and (ii) Effectiveness of Expression which measures the factors inherent in the ability to express oneself effectively. The Reading Test has four subtests with individual scores for each. They are: Vocabulary, Speed of Comprehension, Level of Comprehension and Total Reading.

The Intermediate Mathematics Tests which was given by the C.A.C., measures manipulative skills, knowledge and understanding of formulas, theorems and mathematical terminology, the ability to interpret algebraic or graphic representations and the ability to draw conclusions from data given.

The scores from the various standardized tests, as outlined in the preceding paragraphs, were used in this study, along with the High School Average as predictors of university success and appear in the various tables in their abbreviated forms.



### Compilation of Data

The information collected by the C.A.C. testing program was available on IBM cards; this information included: a student number which identified each student, the sex and matriculation standing of each, the university and faculty in which each was entered and the province in which he or she was a resident. The remaining information consisted of the individual scores each student received on the Standardized Tests, the High School Average of each and the First Year University Average. As pointed out in the introduction, the information pertaining to the Standardized Test scores, High School Average and First Year University Average was used in the C.A.C. Report No. 2, which was published in 1962.

For the present investigation the additional information needed was the university averages for years of attendance after the first. This was obtained by the collection of transcripts of university marks from the several universities involved. These marks were then averaged with the assistance of a desk calculator and the averages punched on the IBM cards in the appropriate columns.

At Acadia University letters rather than percentages are used to evaluate examination results. It was necessary to convert these letters to numerical values in order to calculate correlation coefficients. A+ was assigned a value



of 12, A 11 and so on down to D- with a value of 1. These numbers were used in calculating the various university year averages.

When computing the averages for the various university years only first recorded marks were used. No supplementary examinations or second attendance marks were included in the average because they infer that the student had a better chance of receiving a higher mark. In some instances it was found that students were carrying more or fewer academic classes than normally required by the university; in these cases all marks were averaged. Only academic classes were averaged, which means that courses such as those concerned with religion were omitted.

High School Averages were similarly computed for use in C.A.C. Report No. 2 (1962). The procedure was as follows:

The average for each student was then calculated by finding the average for English, Algebra, Geometry, History, the two best sciences and a foreign language, or one science with the two best languages. It is to be noted that such subjects as Industrial Arts, Music and Commercial subjects were excluded. Furthermore, because of the importance of maintaining numbers, the averages, in some instances, included fewer than seven subjects (p. 10).





### Statistical Treatment

After all the required information was punched on the cards, Pearson Product Moment correlation coefficients between and among the Standardized Test scores, High School Average and University Averages were calculated and arranged in tables (see Appendix for detailed correlation matrices).

Along with the individual correlations multiple correlations were computed to find out if a combination of predictors would yield significantly higher coefficients. These multiple correlations were corrected for sample size and were arranged along with regression weights in tabular form. Cases in which the multiple correlation was not significantly larger than the single coefficients were recorded in the tables along with the other data.

The statistical part of the research was terminated with the calculation of standard errors for the correlation coefficients of the samples studied. As indicated previously, these standard errors were quite large in this study because the number of cases in each group was quite small. These standard errors were recorded at the bottom of each table containing the various correlation coefficients.



## CHAPTER IV

### RESULTS OF THE STUDY

As noted previously the results for each university have been discussed separately and in alphabetical order beginning with Acadia University. The tables indicating simple correlations between predictors and criteria have been arranged in the same order for all universities. On the left hand margin are listed the variables used as predictors. These predictors are in order: the scores made on SCAT Verbal, SCAT Quantitative, SCAT Total, Mechanics of English, Effectiveness of Expression, Vocabulary, Speed of Reading, Level of Comprehension, Total English, Total Reading, Intermediate Mathematics, and High School Average. Along the top of each table appear the Sophomore Year Average (So.), Junior Year Average (Jr.) and Senior Year Average (Sr.) along with the number of cases (N). Each figure in the table represents the correlation coefficient between the variable at the top of the table and the variable on the left hand margin. For ease in recording, the decimal points of all correlation coefficients have been omitted; hence a coefficient of .54 was recorded as 54. Blank spaces within the tables signify that fewer than twenty cases were available and therefore no correlation was calculated. Negative correlations have been underlined. At the bottom of each table appears the average standard error of



the correlation coefficients.

Similar tables were constructed to indicate the correlations between and among High School average and university averages. Also arranged in tabular form were multiple correlations between selected combinations of predictors and the criteria. In these later tables the criteria appear on the left-hand margin followed in order from left to right by, number of cases (N), predictor variables, regression weights (Reg. wts.), standard error and the corrected multiple correlation (R).

#### Prediction at Acadia University

In Table 1 are shown the correlations of Sophomore, Junior and Senior University Averages with the various standardized test scores and High School Average. The table refers to Senior Matriculation students entering the faculty of Arts in 1958. As indicated in the table, the best predictor of success in the Sophomore year was Speed in Reading ( $r = .55$ ), followed by the High School Average ( $r = .48$ ), Level of Comprehension ( $r = .45$ ) and Total Reading ( $r = .41$ ). The remaining correlations were relatively low. In the Junior year all correlations were exceptionally low except for the High School Average ( $r = .43$ ). In the Senior year the best predictor once again was the High School Average ( $r = .55$ ), followed by the SCAT-T ( $r = .42$ ) and SCAT-V ( $r = .40$ ). These results indicated that the High School



TABLE 1

CORRELATIONS OF SOPHOMORE, JUNIOR AND SENIOR YEAR  
AVERAGES WITH STANDARDIZED TEST SCORES AND HIGH  
SCHOOL AVERAGE. SENIOR MATRICULATION STUDENTS  
ENTERING ACADIA UNIVERSITY IN THE FALL OF  
1958

	(Arts)		
	So. (N)	Jr. (N)	Sr. (N)
SCAT-V	15 (25)	03 (25)	40 (21)
SCAT-Q	31 (25)	07 (25)	25 (21)
SCAT-T	26 (25)	02 (25)	42 (21)
Mechan.	16 (25)	13 (25)	20 (21)
Effect.	13 (25)	06 (25)	35 (21)
Vocab.	11 (25)	01 (25)	21 (21)
Speed	55 (25)	36 (25)	31 (21)
Level	45 (25)	27 (25)	25 (21)
Totl. Eng.	41 (25)	21 (25)	32 (21)
Tot. Rd.	22 (25)	04 (25)	34 (21)
Int. Math.	--	--	--
H.S. Av.	48 (25)	43 (25)	55 (21)

Average Standard Error of Correlation 0.15

TABLE 2

CORRELATIONS BETWEEN AND AMONG SOPHOMORE, JUNIOR, SENIOR  
AND HIGH SCHOOL AVERAGES. SENIOR MATRICULATION STUDENTS  
ENTERING ACADIA UNIVERSITY IN THE FALL OF 1958

	(Arts)		
	So. (N)	Jr. (N)	Sr. (N)
H.S. Av.	48 (25)	43 (25)	55 (21)
So. Av.		51 (25)	22 (21)
Jr. Av.			66 (21)

Average Standard Error 0.15





Average was the best predictor of university success at Acadia. Only in the Sophomore year was the High School Average the second best predictor. As indicated in Table 3 only in the Junior year was the correlation coefficient raised significantly by combining predictors. For that group the multiple correlation was .59 between the criterion and a combination of High School Average and the Mechanics of Expression subtest.

In order to ascertain the relationship between and among the three University Year Averages and the High School Average, tables have been constructed, showing the pertinent correlation coefficients.

In Table 2 are shown the correlation coefficients between and among the University Year Average and the High School Average. As indicated by the table, the Sophomore Average was the best predictor ( $r = .51$ ) of success in the Junior year but this was followed quite closely by the High School Average ( $r = .48$ ). In the Senior year, the best predictor was the Junior Year Average ( $r = .66$ ), followed by the High School Average ( $r = .55$ ) and the Sophomore Year Average ( $r = .22$ ). This table indicated that there is an expected close relation between marks received from one year to another at Acadia University. In this instance it is particularly true of the correlation coefficient between Junior and Senior years.



TABLE 3

CORRECTED MULTIPLE CORRELATION BETWEEN THE BEST  
COMBINATION OF PREDICTORS AND SOPHOMORE, JUNIOR  
AND SENIOR UNIVERSITY YEAR AVERAGES. SENIOR  
MATRICULATION STUDENTS ENTERING ACADIA  
UNIVERSITY IN THE FALL OF 1958

(Arts)					
Criterion	N	Predictors	Reg. Wts.	Standard Error of Estimate	Corrected R
So. yr. Av.	25	Speed*			
Jr. yr. Av.	25	Mech.	-0.47	0.86	0.54
		HSA	0.67		
Sr. yr. Av.	21	HSA*			
*Multiple correlation not significantly larger than single correlation.					

#### Prediction at Memorial University

A situation peculiar to Newfoundland and not repeated at other Atlantic institutions was found at Memorial University. When calculating the various university year averages, it was found that many students complete their university education in steps. The university records indicated that many students completed one or more years and then after several years' absence returned. This led to some difficulties in classifying students, a problem which was overcome by positioning them according to the university year in which they were placed upon returning. This means that in some cases students were older than the norm for classes in which they were registered. This should



not interfere greatly, if at all, with the results of the study.

For the Arts, Commerce and Science group it was found from Table 4 that the best predictor of success in the Sophomore year was the High School Average ( $r = .53$ ), followed by the Intermediate Math. Score ( $r = .47$ ). The remaining correlation coefficients were quite low and hence are of dubious predictive value. In the Junior year the best predictor of success was the Vocabulary score ( $r = .49$ ), second was the SCAT Total ( $r = .48$ ) and third Total Reading ( $r = .47$ ). In this sample the High School Average correlated only .32 with the Junior Year Average. The number of students in the Senior year of university was so small that the correlation coefficients have been omitted from the table. It was found for the Arts group that prediction could not be improved significantly by combining the various predictors. Hence, the individual predictors remained as the best indicators of success in each year.

For the Education group the best predictor of success in the Sophomore year was the High School Average ( $r = .60$ ), followed by the scores for SCAT-Verbal, Mechanics of English and Total English with correlations of .48, .47 and .46 respectively. In the Junior year all the correlations were very low with the highest being .29 between the Intermediate Math. score and the University Average. In this case the High School Average correlated only .12 with the University



TABLE 4

CORRELATIONS OF SOPHOMORE AND JUNIOR UNIVERSITY YEAR  
AVERAGES WITH STANDARDIZED TEST SCORES AND HIGH  
SCHOOL AVERAGE. JUNIOR MATRICULATION STUDENTS  
ENTERING MEMORIAL UNIVERSITY IN THE FALL OF  
1958

(Arts, Commerce and Science)		
	So. (N)	Jr. (N)
SCAT-V	21 (34)	37 (22)
SCAT-O	18 (34)	30 (22)
SCAT-T	26 (34)	48 (22)
Mechan.	23 (34)	24 (23)
Effect.	32 (35)	11 (23)
Vocab.	21 (35)	49 (23)
Speed	29 (34)	34 (22)
Level	18 (34)	41 (22)
Tot. Rd.	25 (34)	47 (22)
Tot. Eng.	32 (34)	28 (22)
Int. Math.	47 (35)	40 (23)
H.S. Av.	53 (35)	32 (23)

Average Standard Error of Correlation 0.12

TABLE 5

CORRELATIONS BETWEEN AND AMONG FRESHMAN, SOPHOMORE,  
JUNIOR AND HIGH SCHOOL AVERAGES. SENIOR  
MATRICULATION STUDENTS ENTERING MEMORIAL  
UNIVERSITY IN THE FALL OF 1958

(Arts, Commerce and Science)		
	So.	Jr.
H.S. Av.	.53	.32
So. Av.		.25

Average Standard Error of Correlation 0.05





TABLE 6

CORRECTED MULTIPLE CORRELATIONS BETWEEN THE BEST  
COMBINATION OF PREDICTORS AND SOPHOMORE AND  
JUNIOR YEAR AVERAGES. JUNIOR MATRICULATION  
STUDENTS ENTERING MEMORIAL UNIVERSITY IN  
THE FALL OF 1958

(Arts, Commerce and Science)					
Criterion	N	Predictors	Reg. Wts.	Standard Error of Estimate	Corrected R
So. yr. Av.	34	HSA*			
Jr. yr. Av.	22	Vocab.*			
(Education)					
So. yr. Av.	63	SCAT-V	0.28	0.78	0.62
		HSA	0.48		
Jr. yr. Av.	44	Int. Math.*			
Sr. yr. Av.	31	Mechan.*			
Engineering)					
So. yr. Av.	25	HSA*			
*Multiple correlations not significantly larger than single correlations.					

Average. In the Senior year the highest correlation was between the Mechanics of English score and the Senior Year Average ( $r = .50$ ). The High School Average and the Total English score were the second best predictors, both ( $r = .40$ ). The remainder were all low.

As indicated in Table 6 by combining the High School Average and SCAT-Verbal the correlation coefficient was raised to .65 for the sophomore group. However, for the Junior and Senior years the individual predictors yielded



significant correlations which were as high as the best combination.

The Engineering group yielded only the Sophomore year for observation. The number of students left at the university, after the Sophomore year, was negligible and represented only those who did not complete their program in the usual two year period. The correlation coefficients shown in Table 4 are hence those found between the Sophomore Year Average and the various predictors.

The Engineering group at Memorial University yielded very low correlation coefficients between the various predictors and the Sophomore average. The highest correlation for the Sophomore year was between the High School Average and the respective University Year Average ( $r = .25$ ). For this group no multiple correlation was found to be significantly greater than the single correlation between High School Average and the criterion.

Tables 5 and 8 indicate the correlation coefficients between and among the High School, Sophomore, Junior and Senior Averages for the two Memorial samples. For the Arts, Commerce and Science group Table 5 shows that the High School Average was a better predictor of success in the Junior year ( $r = .32$ ) than the Sophomore average ( $r = .25$ ). However, both of these were comparatively low. For the Education group, as noted in Table 8, the best predictor of success in the Junior year was the Sophomore Year Average,



TABLE 7

CORRELATIONS OF SOPHOMORE, JUNIOR AND SENIOR UNIVERSITY  
YEAR AVERAGES WITH STANDARDIZED TEST SCORES AND HIGH  
SCHOOL AVERAGE. JUNIOR MATRICULATION STUDENTS  
ENTERING MEMORIAL UNIVERSITY IN THE FALL OF  
1958

	(Education)		
	So. (N)	Jr. (N)	Sr. (N)
SCAT-V	48 (64)	26 (44)	17 (31)
SCAT-Q	28 (64)	16 (44)	17 (31)
SCAT-T	44 (64)	25 (44)	16 (31)
Mechan.	47 (63)	12 (44)	50 (31)
Effect.	31 (63)	05 (44)	25 (31)
Vocab.	33 (63)	10 (44)	12 (31)
Speed	38 (63)	27 (44)	16 (31)
Level	31 (63)	16 (44)	19 (31)
Tot. Rd.	39 (63)	22 (44)	18 (31)
Tot. Eng.	46 (63)	14 (44)	40 (31)
Int. Math.	37 (65)	29 (44)	19 (31)
H.S. Av.	60 (65)	12 (44)	40 (31)

Average Standard Error of Correlation 0.08

TABLE 8

CORRELATIONS BETWEEN AND AMONG FRESHMAN, SOPHOMORE,  
JUNIOR, SENIOR AND HIGH SCHOOL AVERAGES. STUDENTS  
ENTERING MEMORIAL UNIVERSITY IN THE FALL OF 1958  
WITH SENIOR MATRICULATION STANDING

	(Education)		
	So.	Jr.	Sr.
H.S. Av.	60	12	40
So. Av.		52	72
Jr. Av.			45
Sr. Av.			

Average Standard Error of Correlation 0.09



TABLE 9

CORRELATIONS OF FRESHMAN AND SOPHOMORE AVERAGES WITH  
STANDARDIZED TEST SCORES AND HIGH SCHOOL AVERAGE.  
JUNIOR MATRICULATION STUDENTS ENTERING MEMORIAL  
UNIVERSITY IN THE FALL OF 1958

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(Engineering)		
	So.	(N)
SCAT-V	06	(25)
SCAT-O	02	(25)
SCAT-T	02	(25)
Mech.	00	(30)
Effect.	12	(30)
Vocab.	08	(30)
Speed	21	(30)
Level	08	(30)
Tot. Rd.	07	(30)
Tot. Eng.	03	(30)
Int. Math.	03	(31)
H.S. Av.	25	(31)

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Average Standard Error of Correlation 0.15

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( $r = .52$ ) as compared to ( $r = .12$ ) for the High School Average. Strangely enough, the best predictor of success in the Senior year was the Sophomore Average ( $r = .72$ ), followed by the Junior Year Average ( $r = .45$ ) and finally by the High School Average ( $r = .40$ ).

In the Memorial groups no predominant predictor of success was noted. The High School Average was the best only twice, both times as a predictor of success in the Sophomore year. The best predictors for the other years were spread among the various standardized tests. Also the correlation coefficients for the Engineering group were quite





low with no apparent reason.

### Prediction at Mount Allison University

Information for the four Mount Allison groups was collected in a similar manner to that for Acadia. Of the four groups studied, three were Senior Matriculation students, while the remaining group was a mixture of Junior and Senior Matriculation students. Of the students enrolling in 1958, only the Engineering group had sufficient numbers for a reliable study. It was necessary because of that problem to combine the Arts and Commerce groups. Again for students entering in 1959, the Arts and Commerce groups were joined. The fourth group consisted of students entering the Science faculty in 1959.

In Table 10 are shown the correlation coefficients between the various predictors and the university averages for the students entering in 1958. In the combined groups of Arts and Commerce it was found, according to Table 10, that the best predictor in the Sophomore year was the High School Average ( $r = .77$ ), followed closely by SCAT-Total ( $r = .75$ ), SCAT-Verbal ( $r = .74$ ) and Vocabulary ( $r = .69$ ). The remaining correlations were also quite high, the lowest being .49.

In the Junior year the best predictor of success was the SCAT-Verbal score ( $r = .75$ ). This was followed by SCAT-Total, Vocabulary and Total Reading all ( $r = .71$ ), and Level of Comprehension ( $r = .69$ ). Again the correlation coefficients



TABLE 10

CORRELATIONS OF SOPHOMORE, JUNIOR AND SENIOR UNIVERSITY AVERAGES WITH STANDARDIZED TEST SCORES AND HIGH SCHOOL AVERAGE. JUNIOR AND SENIOR MATRICULATION STUDENTS ENTERING MOUNT ALLISON UNIVERSITY IN 1958

	(Arts and Commerce) Senior Mat.			(Engineering) Jun. & Sen. Mat.	
	So. (N)	Jr. (N)	Sr. (N)	So. (N)	Jr. (N)
SCAT-V	74 (26)	75 (26)	61 (22)	60 (20)	35 (20)
SCAT-O	49 (26)	41 (26)	35 (22)	60 (20)	31 (20)
SCAT-T	75 (26)	71 (26)	61 (22)	67 (20)	36 (20)
Mechan.	54 (26)	50 (26)	61 (22)	25 (20)	02 (20)
Effect.	59 (26)	53 (26)	45 (22)	80 (20)	41 (20)
Vocab.	69 (26)	71 (26)	62 (22)	47 (20)	21 (20)
Speed	58 (26)	67 (26)	53 (22)	43 (20)	05 (20)
Level	67 (26)	69 (26)	54 (22)	57 (20)	03 (20)
Total Rd.	67 (26)	71 (26)	58 (22)	54 (20)	04 (20)
Tot. Eng.	67 (26)	66 (26)	62 (22)	65 (20)	20 (20)
Int. Math.	56 (21)	68 (21)	--	56 (20)	11 (21)
H.S. Av.	77 (26)	65 (26)	69 (22)	33 (21)	48 (21)

Average Standard Error of Correlation 0.11

TABLE 11

CORRELATIONS BETWEEN AND AMONG UNIVERSITY YEAR AVERAGES, STANDARDIZED TEST SCORES AND HIGH SCHOOL AVERAGE. JUNIOR AND SENIOR MATRICULATION STUDENTS ENTERING MOUNT ALLISON UNIVERSITY IN THE FALL OF 1958

	(Arts and Commerce)			(Engineering)	
	So.	Jr.	Sr.	So.	Jr.
H.S. Av.	77	65	69	33	48
So. Yr. Av.		71	71		57
Jr. Yr. Av.			80		

Average Standard Error of Correlation 0.11



TABLE 12

CORRECTED MULTIPLE CORRELATIONS BETWEEN THE BEST  
COMBINATION OF PREDICTORS AND SOPHOMORE, JUNIOR  
AND SENIOR YEAR AVERAGES. JUNIOR AND SENIOR  
MATRICULATION STUDENTS ENTERING MOUNT  
ALLISON UNIVERSITY IN THE FALL OF 1958  
AND 1959

Criterion	N	Predictors	Reg. Wts.	Standard Error of Estimate	Corrected R
(Arts and Commerce -- Sen. Nat. 1958)					
So. Yr. Av.	21	SCAT-T	.42	.60	.83
		HSA	.48		
Jr. Yr. Av.	21	SCAT-V	1.39	.51	.88
		SCAT-T	-1.46		
		Int. Math	1.14		
Sr. Yr. Av.	21	HSA*			.69
(Engineering -- Junior and Senior Mat. 1958)					
So. Yr. Av.	20	Effect.*			.80
Jr. Yr. Av.	20	HSA*			.48
(Science -- Senior Mat. 1959)					
So. Yr. Av.	30	Effect.	.34	.59	.81
		HSA	.62		
Jr. Yr. Av.	30	Int. Math.	.39	.65	.77
		HSA	.49		
Sr. Yr. Av.	24	Level	-.33	.73	.70
		Int. Math.	.78		
(Arts -- Senior Mat. 1959)					
So. Yr. Av.	43	Vocab.	.29	.66	.77
		HSA	.59		
Jr. Yr. Av.	43	HSA*			.63
Sr. Yr. Av.	36	HSA*			.58

\*Multiple correlations not significantly larger than single correlations.



were large, thus indicating that the predictors were reliable. In the Senior year the best predictor was once again the High School Average ( $r = .69$ ). The second best, Vocabulary and Total English, were both ( $r = .62$ ) and the third best, SCAT-Verbal, SCAT-Total and Mechanics of English all ( $r = .61$ ). As shown in Table 12 a combination of SCAT-Total and High School Average correlated .81 with Sophomore average. For the Junior year a multiple correlation of .86 was obtained using SCAT-Verbal, SCAT-Total and Intermediate Mathematics. For the Senior year no combination of predictors significantly improved prediction over that obtained from single variables.

In Engineering we find from the table that the best predictor of success in the Sophomore year was the score for Effectiveness in Expression ( $r = .80$ ). This was followed by SCAT-Total ( $r = .67$ ), Total English ( $r = .65$ ) and SCAT-Verbal and SCAT-O, both ( $r = .60$ ). A possible reason for such high correlation coefficients might be the type of courses taken in the Sophomore year. In referring to the program of studies at Mount Allison University it was found that in the Sophomore year of Engineering the subjects taken were all typical Arts and Science courses except for a course in drawing, which in many cases was considered to be an extra load. Therefore the correlations follow quite closely those for the Arts and Science groupings.





The High School Average, in comparison with the others, correlated very lowly ( $r = .33$ ) with the Sophomore Year Average. In the Junior year the best predictor of success was the High School Average ( $r = .48$ ), followed by Effectiveness in Expression ( $r = .41$ ), SCAT-Total ( $r = .36$ ) and SCAT-Verbal ( $r = .35$ ). The remaining correlations were very low. Only for the Senior year did a combination of variables improve prediction. SCAT-Total and Speed of Comprehension correlated .84 with the criterion. Mount Allison University does not give a complete course in Engineering, with most students leaving at the end of their Junior year. Hence, not enough students were available for an adequate sample for the Senior year.

In these two groups the High School Average was the predominant predictor. Out of the five years studied (three in Arts and Commerce and two in Engineering) the best predictor three times was the High School Average. Also, in only one case (Sophomore Engineers) was it so low as to be of little predictive value.

In Table 11 are indicated the correlation coefficients between and among the university year averages and the High School Average. For the Engineering group the best predictor of success in the Junior Year was the Sophomore Year Average ( $r = .57$ ). The correlation coefficient between the High School and Junior Year Averages was somewhat smaller ( $r = .48$ ).

Similar results were found for the Arts and Commerce



group. The best predictor of success in the Junior year and Senior year was the Sophomore Year Average ( $r = .71$ ). This compared with correlations of .65 and .69 respectively, between High School Average, and the Sophomore and Junior Year Average. The same trend held for the comparison between the High School Average and Junior Averages as predictors of success in the Senior year. The correlations of the Junior, Sophomore and High School Averages with the Senior Year Averages were: .80, .71 and .69 respectively. In these two samples from the 1958 group it was quite apparent that the best predictor of success in any one year was the previous year's average.

In relation to the 1959 group at Mount Allison University, table 13 reveals the following: in Arts the best predictor of success in the Sophomore year was the High School Average ( $r = .72$ ). This was followed by SCAT-Total ( $r = .64$ ), Total English ( $r = .61$ ) and Mechanics of Expression ( $r = .57$ ). In the Junior year the best predictor of success was again the High School Average ( $r = .63$ ), followed by the Mechanics of Expression ( $r = .53$ ) and Total English ( $r = .52$ ). The trend continued in the Senior year, where the High School Average was the best predictor ( $r = .58$ ) as compared to SCAT-Total ( $r = .53$ ), Total English ( $r = .50$ ) and SCAT-Verbal ( $r = .48$ ). As indicated in Table 12 the Sophomore Average was best predicted by combining vocabulary and High School Average ( $r = .75$ ). For the Junior and Senior



TABLE 13

CORRELATIONS OF SOPHOMORE, JUNIOR AND SENIOR UNIVERSITY AVERAGES WITH STANDARDIZED TEST SCORES AND HIGH SCHOOL AVERAGE. SENIOR MATRICULATION STUDENTS ENTERING MOUNT ALLISON UNIVERSITY IN 1959

	(Arts and Commerce)			(Science)		
	So. (N)	Jr. (N)	Sr. (N)	So. (N)	Jr. (N)	Sr. (N)
SCAT-V	52 (46)	48 (46)	48 (38)	57 (30)	43 (30)	28 (25)
SCAT-Q	55 (46)	35 (46)	39 (38)	43 (30)	55 (30)	59 (25)
SCAT-T	64 (46)	48 (46)	53 (38)	57 (30)	53 (30)	46 (25)
Mechan.	57 (46)	53 (46)	49 (38)	51 (29)	47 (29)	30 (24)
Effect.	47 (46)	37 (46)	39 (38)	62 (29)	42 (29)	28 (24)
Vocab.	54 (46)	41 (46)	38 (38)	52 (30)	23 (30)	07 (25)
Speed	39 (46)	29 (46)	38 (38)	51 (30)	29 (30)	29 (25)
Level	35 (46)	32 (46)	24 (38)	57 (30)	30 (30)	03 (25)
Tot. Rd.	52 (46)	41 (46)	39 (38)	62 (30)	31 (30)	14 (25)
Tot. Eng.	61 (46)	52 (46)	50 (38)	66 (29)	46 (29)	30 (24)
Int. Math.	54 (43)	42 (43)	45 (36)	67 (29)	68 (29)	65 (24)
H.S. Av.	72 (46)	63 (46)	58 (38)	77 (30)	72 (30)	47 (25)

Average Standard Error of Correlation 0.12

TABLE 14

CORRELATIONS BETWEEN AND AMONG SOPHOMORE, JUNIOR AND SENIOR AND HIGH SCHOOL AVERAGES. STUDENTS ENTERING MOUNT ALLISON UNIVERSITY IN THE FALL OF 1959 WITH SENIOR MATRICULATION STANDING

	(Arts and Commerce)			(Science)		
	So.	Jr.	Sr.	So.	Jr.	Sr.
H.S. Av.	72	63	58	77	72	47
So. Av.		83	69		79	62
Jr. Av.			78			85
Sr. Av.						

Standard Error of Correlation 0.12





years the single predictors were as good as any combination.

In the Science group the results were very similar to those for Arts and Commerce. In the Sophomore year the best predictor of success was the High School Average ( $r = .77$ ), followed by Intermediate Mathematics ( $r = .67$ ) and Total English ( $r = .66$ ). Again in the Junior year the High School Average was the best indicator of success ( $r = .72$ ), followed by Intermediate Mathematics ( $r = .68$ ) and SCAT-Quantitative score ( $r = .59$ ) and the High School Average ( $r = .47$ ). For the Science group multiple correlations of .83, .78 and .72 were found between various predictors and Sophomore, Junior and Senior year averages respectively.

In the two groups described above the High School Average once again showed its predictive value. Out of the six years studied in the 1959 groups, (three in Arts and Commerce and three in Science), it was the best predictor of success five times. Also in three of these cases the correlation coefficient between the High School Average and the University Average was over .70. This suggested that the High School Average was a very good predictor of success, particularly in the Sophomore and Junior years.

Table 14 indicates how the High School Average compared to university year averages as predictors in succeeding years. In reference to Table 14 we find that in the Junior year of Arts there was a very high correlation (.85) between Sophomore Year Average and Junior Year Average. This was to be compared





to a value for the High School Average of .63. Again for the Senior year of Arts the best predictor of success was the Junior Year Average ( $r = .79$ ), followed by the Sophomore Year Average ( $r = .69$ ) and lastly by the High School Average ( $r = .58$ ).

The same observations were found in the Science group, where the best predictor of success in the Junior year was the Sophomore Year Average ( $r = .79$ ), followed closely by the High School Average ( $r = .72$ ). In the Senior year the best predictor of success was the Junior Year Average ( $r = .85$ ) followed by the Sophomore Year Average ( $r = .62$ ) and the High School Average ( $r = .47$ ).

These observations again amplify the contention previously made: that the best predictor of success in any year of university is the average made in the preceding year. Also, the High School Average, although it does not correlate as highly, was a good predictor, especially for the Sophomore and Junior years.

#### Prediction at Prince of Wales College

In Table 15 are shown the correlations of the Sophomore University Average with the various Standardized Test Scores and High School Average. The students represented comprise those who entered in 1959 with Junior Matriculation standing and proceeded towards an Arts or Science degree. It should be noted that in 1959 Prince of Wales College was still a



TABLE 15

CORRELATIONS OF SOPHOMORE YEAR AVERAGE WITH STANDARDIZED TEST SCORES AND HIGH SCHOOL AVERAGE. JUNIOR MATRICULATION STUDENTS ENTERING PRINCE OF WALES COLLEGE IN THE FALL OF 1959

(Arts and Science)		
	So. (N)	
SCAT-V	46	(27)
SCAT-Q	73	(27)
SCAT-T	68	(27)
Mechan.	50	(27)
Effect.	64	(27)
Vocab.	50	(27)
Speed	66	(27)
Level	73	(27)
Tot. Rd.	69	(27)
Tot. Eng.	68	(27)
Int. Math.	54	(27)
H.S. Av.	63	(27)
Average Standard Error of Correlation 0.12		

TABLE 16

CORRECTED MULTIPLE CORRELATIONS BETWEEN THE BEST COMBINATION OF PREDICTORS AND SOPHOMORE AVERAGE. JUNIOR MATRICULATION STUDENTS ENTERING PRINCE OF WALES COLLEGE IN 1959

Criterion	N	Predictors	Reg. Wts.	Standard Error of Estimate	Corrected R
So. Yr. Av.	27	SCAT-O	.50	.55	.77
		Level	.50		



junior college offering only the first two years of university.

In reference to Table 15 we find that in the Sophomore year the best single predictors of success were the scores for SCAT-Quantitative and Level of Comprehension which correlated .73 with the criterion. These were followed by the Total Reading Score ( $r = .69$ ), Total English ( $r = .68$ ) and SCAT-Total also .68. Also a very high correlation (.87) existed between the Freshman and Sophomore Averages.

As indicated by Table 16 a high multiple correlation of .77 was found when SCAT-Quantitative and Level of Comprehension subtests were combined.

#### Prediction at Saint Dunstan's University

Due to the small number of students enrolled at Saint Dunstan's, the faculties of Arts, Commerce and Science were combined to provide a sample of adequate size.

As indicated in Table 16 the three best predictors of success in the Sophomore year were the High School Average, Mechanics of English and Level of Comprehension. For the Sophomore sample the correlations between those three predictors and college averages were .69, .55 and .45 respectively.

In the Junior year the best predictor of college average was Mechanics of English ( $r = .76$ ) followed closely by SCAT-Verbal ( $r = .75$ ) and Total English score ( $r = .70$ ).



For the Senior year sample, the Mechanics of Expression subtest correlated highest with college grades (.58), followed by High School Average .55 and SCAT-Verbal .49.

Table 18 indicates that the correlations between grades in various years of university and High School Average compared quite favorably with University Average in predicting averages of later years at Saint Dunstan's. Only in the Senior years was the High School Average surpassed as a predictor. In this case the best predictor of success was the average obtained in the Junior year. These findings perhaps can be related to the atypical academic structure found at Saint Dunstan's at the time of data collection. Located on the campus was a feeder high school which provided many of the students studying towards a bachelor degree. Undoubtedly a closer relationship existed in the areas of standards, expectancies and staffing than was usually found between high schools and universities in general.

Only in the Senior year did combinations of variables improve prediction. As shown in Table 19 the Mechanics of Expression subtest along with the Intermediate Math test correlated .70 with the criterion.





TABLE 17

CORRELATIONS OF SOPHOMORE, JUNIOR AND SENIOR UNIVERSITY  
YEAR AVERAGES WITH STANDARDIZED TEST SCORES AND HIGH  
SCHOOL AVERAGE. JUNIOR MATRICULATION STUDENTS ENTERING  
SAINT DUNSTAN'S UNIVERSITY IN THE FALL OF 1958

	(Arts, Commerce and Science)					
	So. (N)		Jr. (N)		Sr. (N)	
SCAT-V	42	(24)	75	(24)	49	(24)
SCAT-Q	08	(24)	46	(24)	04	(24)
SCAT-T	28	(24)	67	(24)	30	(24)
Mech.	55	(22)	76	(22)	58	(22)
Effect.	20	(22)	55	(22)	23	(22)
Vocab.	43	(22)	55	(22)	31	(22)
Speed	36	(22)	64	(22)	26	(22)
Level	45	(22)	53	(22)	20	(22)
Tot. Rd.	43	(22)	61	(22)	27	(22)
Tot. Eng.	43	(22)	70	(22)	41	(22)
Int. Math.	08	(29)	32	(29)	01	(24)
H.S. Av.	69	(24)	58	(24)	55	(24)

Average Standard Error of Correlation 0.14

TABLE 18

CORRELATIONS BETWEEN AND AMONG FRESHMAN, SOPHOMORE,  
JUNIOR, SENIOR AND HIGH SCHOOL AVERAGES. JUNIOR  
MATRICULATION STUDENTS ENTERING SAINT DUNSTAN'S  
UNIVERSITY IN THE FALL OF 1958

(Arts, Commerce and Science)			
	So.	Jr.	Sr.
H.S. Av.	69	58	55
So. Yr. Av.		45	70
Jr. Yr. Av.			76

Average Standard Error of Correlation 0.11



TABLE 19

CORRECTED MULTIPLE CORRELATIONS BETWEEN THE BEST  
COMBINATION OF PREDICTORS AND SOPHOMORE, JUNIOR  
AND SENIOR YEAR AVERAGES. JUNIOR MATRICULATION  
STUDENTS ENTERING SAINT DUNSTAN'S UNIVERSITY  
IN 1958

(Arts, Commerce and Science)					
Criterion	N	Predictors	Reg. Wts.	Standard Error of Estimate	Corrected R
So. Yr. Av.	22	HSA*			
Jr. Yr. Av.	22	Mechan.*			
Sr. Yr. Av.	22	Mechan.	.99	.70	.70
		Int. Math.	-0.64		
*Multiple correlation not significantly larger than single correlation coefficient.					

#### Prediction at Saint Francis Xavier University

Two samples were used from Saint Francis Xavier. They were composed of: (1) students in Arts and Commerce entering in 1958, and (2) students in Arts and Commerce entering in 1959. Other groups were dropped from the study for reasons previously outlined. The number of students in each group was relatively small, hence numerous blanks occur in the tables indicating that fewer than twenty cases were available.

As indicated in Table 20 the correlation coefficients for the group entering in 1959 were considerably higher than those for the 1958 group. For the 1958 group the correlation between the Sophomore Average and the best single predictor



TABLE 20

CORRELATIONS OF SOPHOMORE AND JUNIOR AVERAGES WITH  
STANDARDIZED TEST SCORES AND HIGH SCHOOL AVERAGE.  
SENIOR MATRICULATION STUDENTS ENTERING SAINT  
FRANCIS XAVIER UNIVERSITY IN 1958 AND 1959

	(Arts and Commerce 1958)				(Arts and Commerce 1959)			
	So. (N)		Jr. (N)		So. (N)		Jr. (N)	
SCAT-V	28	(20)	44	(20)	59	(22)	69	(22)
SCAT-Q	48	(20)	19	(20)	64	(22)	45	(22)
SCAT-T	43	(20)	38	(20)	72	(22)	64	(22)
Mech.	36	(20)	39	(20)	27	(22)	58	(22)
Effect.	31	(20)	59	(20)	43	(22)	57	(22)
Vocab.	20	(20)	47	(20)	56	(22)	68	(22)
Speed	36	(20)	49	(20)	48	(22)	64	(22)
Level	27	(20)	40	(20)	49	(22)	68	(22)
Tot. Rd.	32	(20)	50	(20)	57	(22)	74	(22)
Tot. Eng.	41	(20)	59	(20)	45	(22)	68	(22)
Int. Math.	--				71	(22)	59	(22)
H.S. Av.	44	(20)	61	(20)	63	(22)	69	(22)
Average Standard Error of Correlation 0.15					Average Standard Error of Correlation 0.11			

TABLE 21

CORRELATIONS BETWEEN AND AMONG THE SOPHOMORE, JUNIOR  
AND HIGH SCHOOL AVERAGES. SENIOR MATRICULATION  
STUDENTS ENTERING SAINT FRANCIS XAVIER  
UNIVERSITY IN 1958 AND 1959

	(Arts and Commerce 1958)		(Arts and Commerce 1959)	
	So.	Jr.	So.	Jr.
H.S. Av.	44	61	63	69
So. Av.		61		74
Average Standard Error of Correlation 0.14			Average Standard Error of Correlation 0.11	



SCAT-Quantitative was .48 as compared to a correlation of .72 between SCAT-Total and the Sophomore Average for the 1959 group. In the Junior year the best predictor for the 1958 group was the High School Average ( $r = .61$ ). For the 1959 group the highest correlation .74 was found between the criterion and Total Reading Score. The number of senior students in each group was less than twenty and therefore dropped from the tables.

As shown by Table 21 the correlations between the Sophomore and Junior Year Averages were higher or as high as the correlations between the High School Average and the Junior year average. For the 1958 group the coefficient was .61 and for the 1959 group it was .74.

It was also demonstrated that prediction could not be significantly improved by combining various predictors. Multiple correlations obtained were not significantly larger than the single correlations hence no table appears for these data.





## CHAPTER V

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

For the past few decades admittance to universities in the Atlantic Provinces has been dependent upon marks received on the grade XII external examinations. The validity of such an entrance requirement was first questioned in 1958 when the Central Advisory Committee on Education (C.A.C.) introduced, for research purposes, standardized tests. These tests which included the SCAT, the COOP English Test and the Intermediate Mathematics Test were compared to the grade XII average as predictors of success in the first year of university. The results of this study indicated that the high school average was the best single predictor of success in the first year of studies at universities in the Atlantic Provinces.

Pau (1965) extended the research begun by the C.A.C. in 1958 by examining the prediction of success in years after the first at Dalhousie University and the University of New Brunswick. Pau found that high school average was still the best predictor of success when the criteria were university averages in years after the first.

The present study concludes the research begun by Pau by investigating the prediction of success in years after the first at the following universities: Acadia, Memorial, Mount Allison, Prince of Wales, Saint Dunstan's and Saint



Francis Xavier. In this study, unlike others completed with the C.A.C. data, multiple correlation technique was used to determine whether or not prediction could be improved by combining various single predictor variables.

The four specific purposes of this study were:

- (1) To compare high school average with standardized tests as predictors of university success in years after the first.
- (2) To compare the high school average with university averages as predictors of success in years after the first.
- (3) To determine if success can be predicted more readily in one faculty than another.
- (4) To ascertain the effect of combining various single predictor variables on the prediction of success in years after the first.

From the findings of this study it was evident that the best predictor of success in any year of university was the academic work completed in the preceding year. When all universities were considered together the median correlations between the averages of the Sophomore-Junior, Sophomore-Senior and Junior-Senior years were .67, .62 and .77 respectively.

The second best predictor of success in any year of study was the grade XII average. The median correlations between this predictor and Sophomore, Junior and Senior



averages were, in order, .63, .61 and .51. In comparison the standardized test scores were inferior predictors. For example, the best predictor of the standardized tests, SCAT-Total, Correlated .50, .48 and .44 respectively with Sophomore, Junior and Senior averages. It was evident from the results that prediction becomes more difficult as students progress to the later years of their program. This was expected since the grouping of students in the Senior year would be much more homogeneous than in the Sophomore year.

As noted previously many faculties within each university had to be joined in order to arrive at samples of adequate size. As a result there remained only five distinct groups which included one of Arts, one of Education, one of Science and two of Engineering. For all these groups only high school average correlated highly with university average across all three years. Success in the Science faculty was found to be the most predictable followed in order by Engineering, Arts and Education. It should be noted however, that success was generally more predictable at some universities than others. For example, prediction of success at Mount Allison University was better than at any other institution considered in the study. For this reason, it may be assumed that the comparatively good predictability of grades in the faculties of Science and Engineering was in part related to the institution from which



the groups came.

It would appear, from the results of this study, that the predictive power gained by using combinations of predictor variables is not great enough to warrant the added expense and time which would be involved. In only ten of the twenty-eight groups considered was the correlation coefficient significantly raised by combining various predictor variables. In those ten cases the median increase in the size of correlation coefficient was .05.

The step-wise regression analysis which was used in this study gave only the best combination of predictor variables for each group considered. As indicated in the tables in Chapter IV the predictor variables included in each combination were different for each of the ten groups involved. As a result, no overall battery of predictor variable could be used for predictive purposes.

It would seem, on the basis of this study, that the innovation of standardized tests as predictors of university success is not warranted in the Atlantic Provinces. They do merit consideration however, if common standards become important.

The present method of selecting students on the merit of high school examinations appears to be the best answer, although their predictive validity is not as high as desired. Also, contrary to some research in the area of prediction,







multiple correlation technique does not seem to be a practical solution.

Undoubtedly success at university is a function of many aspects of the individual including academic ability, motivation and personality. Much research has been completed on academic predictors but very little on affective, social and motivational variables. Perhaps future research in these non-academic areas would be fruitful in respect to prediction of university success.



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## A P P E N D I X



TABLE 22

CORRELATIONS BETWEEN AND AMONG SOPHOMORE, JUNIOR AND  
SENIOR AVERAGES, STANDARDIZED TEST SCORES AND HIGH  
SCHOOL AVERAGE FOR SENIOR MATRICULATION STUDENTS  
ENTERING ARTS AT ACADIA UNIVERSITY IN 1958

	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. So. Av.	51	22	15	31	26	16	13	11	55	45	41	22		48
2. Jr. Av.		66	03	<u>07</u>	<u>02</u>	13	<u>06</u>	<u>01</u>	36	27	21	04		43
3. Sr. Av.			40	25	42	20	35	21	31	25	32	34		55
4. SCAT-V				46	88	68	76	88	45	74	81	87		51
5. SCAT-Q					82	42	62	50	24	34	43	58		57
6. SCAT-T						66	80	82	42	65	75	85		62
7. Mechan.							64	62	26	53	55	86		51
8. Effect.								65	27	55	59	91		57
9. Vocab.									50	70	87	80		42
10. Speed										68	82	45		35
11. Level											91	72		50
12. Tot. Rd.												78		49
13. Tot. Eng.														61
14. Int. Math.														65
15. H. S. Av.														

Decimal points have been omitted for ease in recording.





TABLE 23

CORRELATIONS BETWEEN AND AMONG SOPHOMORE AND JUNIOR  
AVERAGES, STANDARDIZED TEST SCORES AND HIGH SCHOOL  
AVERAGE FOR JUNIOR MATRICULATION STUDENTS ENTERING  
ARTS, COMMERCE AND SCIENCE AT MEMORIAL UNIVERSITY  
IN 1958

	2	3	4	5	6	7	8	9	10	11	12	13	14
1. So. Av.	25	21	18	26	23	32	21	29	18	25	32	47	53
2. Jr. Av.		37	30	48	24	11	49	34	41	47	28	40	32
3. SCAT-V			08	77	50	61	82	83	78	90	77	29	34
4. SCAT-Q				68	30	37	03	29	10	16	33	63	51
5. SCAT-T					56	68	64	79	65	77	77	58	58
6. Mechan.						65	63	50	41	59	87	38	54
7. Effect.							60	57	48	63	89	28	46
8. Vocab.								55	65	84	80	31	44
9. Speed									87	89	72	37	53
10. Level										93	66	27	42
11. Tot. Rd.											82	36	53
12. Tot. Eng.												38	62
13. Int. Math.													66
14. H.S. Av.													

Decimal points have been omitted for ease in recording.



TABLE 24

CORRELATIONS BETWEEN AND AMONG SOPHOMORE, JUNIOR AND  
SENIOR AVERAGES, STANDARDIZED TEST SCORES AND HIGH  
SCHOOL AVERAGE FOR JUNIOR MATRICULATION STUDENTS  
ENTERING EDUCATION AT MEMORIAL UNIVERSITY  
IN 1958

	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. So. Av.	52	72	48	28	44	47	31	33	38	31	39	46	37	60
2. Jr. Av.		45	26	16	25	12	05	10	27	16	22	14	29	12
3. Sr. Av.			17	17	16	50	25	12	16	19	18	40	19	40
4. SCAT-V				42	87	53	62	79	58	58	74	73	47	41
5. SCAT-Q					80	28	30	26	35	39	38	38	72	44
6. SCAT-T						50	57	68	55	59	68	68	70	49
7. Mechan.							50	51	46	43	53	81	18	44
8. Effect.								62	48	48	59	87	19	39
9. Vocab.									65	61	85	76	29	38
10. Speed										83	93	70	31	35
11. Level											90	68	33	28
12. Tot. Rd.												80	35	38
13. Tot. Eng.													27	48
14. Int. Math.														47
15. H. S. Av.														

Decimal points have been omitted for ease in recording.



TABLE 25

CORRELATIONS BETWEEN AND AMONG SOPHOMORE AVERAGE,  
STANDARDIZED TEST SCORE AND HIGH SCHOOL AVERAGE  
FOR JUNIOR MATRICULATION STUDENTS ENTERING  
ENGINEERING AT MEMORIAL UNIVERSITY IN 1958

	2	3	4	5	6	7	8	9	10	11	12	13
1. So. Av.	06	02	<u>02</u>	00	12	08	<u>21</u>	<u>08</u>	<u>07</u>	03	03	25
2. SCAT-V		14	83	40	57	87	59	57	80	73	33	22
3. SCAT-Q			65	47	09	06	22	24	20	33	74	58
4. SCAT-T				57	49	69	57	58	73	74	65	46
5. Mechan.					38	39	39	26	41	77	52	46
6. Effect.						49	49	48	56	82	19	22
7. Vocab.							60	58	85	69	24	23
8. Speed								66	88	71	32	33
9. Level									85	63	25	21
10. Tot. Rd.										79	31	31
11. Tot. Eng.											43	42
12. Int. Math.												70
13. H. S. Ac.												

Decimal points have been omitted for ease in recording.



TABLE 26

CORRELATIONS BETWEEN AND AMONG SOPHOMORE, JUNIOR AND  
SENIOR AVERAGES, STANDARDIZED TEST SCORES AND HIGH  
SCHOOL AVERAGE FOR SENIOR MATRICULATION STUDENTS  
ENTERING ARTS AND COMMERCE AT MOUNT ALLISON  
UNIVERSITY IN 1958

	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. So. Av.	71	71	74	49	75	54	59	69	58	67	67	67	56	77
2. Jr. Av.		80	75	41	71	50	53	71	67	69	71	66	68	65
3. Sr. Av.			61	35	61	61	45	62	53	54	58	62		69
4. SCAT-V				40	87	59	73	93	85	89	92	84	55	68
5. SCAT-Q					79	51	29	46	48	41	47	48	87	44
6. SCAT-T						67	63	85	81	81	85	81	84	69
7. Mechan.							62	72	69	54	68	86	63	64
8. Effect.								74	73	78	77	88	39	65
9. Vocab.									91	90	97	92	58	61
10. Speed										88	96	91	62	58
11. Level											96	86	53	54
12. Tot. Rd.												93	60	60
13. Tot. Eng.													61	70
14. Int. Math.														66
15. H. S. Av.														

Decimal points have been omitted for ease in recording.





TABLE 27

CORRELATIONS BETWEEN AND AMONG SOPHOMORE, JUNIOR AND  
SENIOR AVERAGES, STANDARDIZED TEST SCORES AND HIGH  
SCHOOL AVERAGE FOR JUNIOR AND SENIOR MATRICULATION  
STUDENTS ENTERING ENGINEERING AT MOUNT ALLISON  
UNIVERSITY IN 1958

	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. So. Av.	57	70	60	60	67	25	80	47	43	57	54	65	56	33
2. Jr. Av.		72	35	31	36	02	41	21	<u>05</u>	03	04	20	11	48
3. Sr. Av.			54	45	58	-13	57	29	13	16	19	29	44	53
4. SCAT-V				55	90	27	52	77	70	58	76	60	61	35
5. SCAT-Q					86	37	58	50	72	58	67	64	77	28
6. SCAT-T						39	63	75	83	68	84	72	78	37
7. Mechan.							49	58	58	34	55	79	20	43
8. Effect.								65	54	65	68	87	59	35
9. Vocab.									71	57	83	80	57	47
10. Speed										73	92	80	70	08
11. Level											89	73	74	06
12. Tot. Rd.												89	77	21
13. Tot. Eng.													61	38
14. Int. Math.														33
15. H. S. Av.														

Decimal points have been omitted for ease in recording.



TABLE 28

CORRELATIONS BETWEEN AND AMONG SOPHOMORE, JUNIOR AND  
SENIOR AVERAGES, STANDARDIZED TEST SCORES AND HIGH  
SCHOOL AVERAGE FOR SENIOR MATRICULATION STUDENTS  
ENTERING ARTS AND COMMERCE AT MOUNT ALLISON  
UNIVERSITY IN 1959

	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. So. Av.	83	69	52	55	64	57	47	54	39	35	52	61	54	72
2. Jr. Av.		78	48	35	48	53	37	41	29	32	41	52	42	63
3. Sr. Av.			48	39	53	49	39	38	38	24	39	50	45	58
4. SCAT-V				44	86	52	71	81	57	63	80	77	65	48
5. SCAT-Q					83	68	52	35	50	34	48	66	71	57
6. SCAT-T						70	73	71	63	59	77	84	79	62
7. Mechan.							55	47	54	41	58	84	69	59
8. Effect.								51	63	66	72	89	61	48
9. Vocab.									44	43	76	64	51	41
10. Speed										76	88	77	57	32
11. Level											86	72	55	24
12. Tot. Rd.												85	65	40
13. Tot. Eng.													75	58
14. Int. Math.														60
15. H. S. Av.														

Decimal points have been omitted for ease in recording.



TABLE 29

CORRELATIONS BETWEEN AND AMONG SOPHOMORE, JUNIOR AND  
SENIOR AVERAGES, STANDARDIZED TEST SCORES AND HIGH  
SCHOOL AVERAGE FOR SENIOR MATRICULATION STUDENTS  
ENTERING SCIENCE AT MOUNT ALLISON UNIVERSITY  
IN 1959

	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. So. Av.	79	62	57	43	57	51	62	52	51	57	62	66	67	77
2. Jr. Av.		85	43	55	53	47	42	23	29	30	31	46	68	72
3. Sr. Av.			28	59	46	30	28	07	29	-03	14	30	65	47
4. SCAT-V				62	94	58	64	77	55	59	76	77	46	59
5. SCAT-Q					84	53	50	31	54	34	46	59	78	49
6. SCAT-T						62	63	67	60	54	72	77	63	62
7. Mechan.							61	37	44	30	45	86	47	49
8. Effect.								68	44	47	65	88	47	46
9. Vocab.									49	59	83	69	35	47
10. Speed										79	87	63	58	45
11. Level											89	59	39	51
12. Tot. Rd.												77	51	55
13. Tot. Eng.													55	58
14. Int. Math.														59
15. H. S. Av.														

Decimal points have been omitted for ease in recording.



TABLE 30

CORRELATIONS BETWEEN AND AMONG SOPHOMORE AVERAGE,  
STANDARDIZED TEST SCORES AND HIGH SCHOOL AVERAGE  
FOR JUNIOR MATRICULATION STUDENTS ENTERING ARTS  
AND SCIENCE AT PRINCE OF WALES COLLEGE IN 1959

	2	3	4	5	6	7	8	9	10	11	12	13
1. So. Av.	46	73	68	50	64	50	66	73	69	68	54	63
2. SCAT-V		36	91	51	79	84	76	70	84	79	25	47
3. SCAT-Q			70	53	48	37	39	45	45	55	69	57
4. SCAT-T				62	80	84	77	75	86	85	47	57
5. Mechan.					62	54	56	52	58	84	49	37
6. Effect.						70	75	73	79	92	40	63
7. Vocab.							75	69	88	78	31	50
8. Speed								88	95	83	26	50
9. Level									93	80	39	57
10. Tot. Rd.										87	37	57
11. Tot. Eng.											49	59
12. Int. Math.												40
13. H. S. Av.												

Decimal points have been omitted for ease in recording.





TABLE 31

CORRELATIONS BETWEEN AND AMONG SOPHOMORE, JUNIOR AND SENIOR AVERAGES, STANDARDIZED TEST SCORES AND HIGH SCHOOL AVERAGE FOR JUNIOR MATRICULATION STUDENTS ENTERING ARTS AND COMMERCE AT SAINT DUNSTAN'S UNIVERSITY IN 1958

	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. So. Av.	45	70	42	08	28	55	20	43	36	45	43	43	08	69
2. Jr. Av.		76	75	46	67	76	55	55	64	53	61	70	32	58
3. Sr. Av.			49	04	30	58	23	31	26	20	27	41	01	55
4. SCAT-V				60	87	76	79	80	75	71	81	84	53	66
5. SCAT-Q					90	66	73	63	70	63	70	75	85	43
6. SCAT-T						80	85	81	82	75	85	89	79	62
7. Mechan.							78	75	81	75	81	93	65	79
8. Effect.								78	83	77	84	94	76	56
9. Vocab.									81	81	93	86	62	73
10. Speed										85	95	91	66	62
11. Level											93	85	60	66
12. Tot. Rd.												92	67	70
13. Tot. Eng.													74	73
14. Int. Math.														47
15. H. S. Av.														

Decimal points have been omitted for ease in recording.



TABLE 32

CORRELATIONS BETWEEN AND AMONG SOPHOMORE AND JUNIOR  
AVERAGES, STANDARDIZED TEST SCORES AND HIGH SCHOOL  
AVERAGE FOR SENIOR MATRICULATION STUDENTS  
ENTERING ARTS AND COMMERCE AT SAINT  
FRANCIS XAVIER UNIVERSITY IN 1958

	2	3	4	5	6	7	8	9	10	11	12	13
1. So. Av.	61	28	48	43	36	31	20	36	27	32	41	44
2. Jr. Av.		44	19	38	39	59	47	49	40	50	59	61
3. SCAT-V			42	89	75	75	88	58	68	79	93	58
4. SCAT-Q				79	48	32	22	28	28	30	47	54
5. SCAT-T					77	67	71	51	57	66	86	68
6. Mechan.						50	71	20	24	41	80	63
7. Effect.							63	61	61	68	86	60
8. Vocab.								54	61	79	86	52
9. Speed									87	92	66	51
10. Level										94	69	43
11. Tot. Rd.											82	54
12. Tot. Eng.												60
13. H.S. Av.												

Decimal points have been omitted for ease in recording.



TABLE 33

CORRELATIONS BETWEEN AND AMONG SOPHOMORE, JUNIOR AND  
SENIOR AVERAGES, STANDARDIZED TEST SCORES AND HIGH  
SCHOOL AVERAGE FOR SENIOR MATRICULATION STUDENTS  
ENTERING ARTS AND COMMERCE AT SAINT FRANCIS  
XAVIER UNIVERSITY IN 1959

	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. So. Av.	74	66	59	64	72	27	43	56	48	49	57	45	71	63
2. Jr. Av.		88	64	45	64	58	57	68	64	68	74	68	59	69
3. Sr. Av.			58	42	60	26	47	51	51	59	60	49	41	40
4. SCAT-V				43	87	38	78	84	77	75	87	74	53	51
5. SCAT-Q					82	46	58	54	51	38	53	58	77	53
6. SCAT-T						47	81	83	76	67	83	77	75	61
7. Mechan.							66	49	70	58	67	86	38	63
8. Effect.								74	85	77	87	93	53	67
9. Vocab.									61	64	83	76	64	68
10. Speed										88	93	90	51	60
11. Level											93	83	50	66
12. Tot. Rd.												93	61	72
13. Tot. Eng.													55	74
14. Int. Math.														69
15. H.S. Av.														

Decimal points have been omitted for ease in recording.











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